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MAY 21, 1949

TECHNOLOGY DEPARTMENT

SCIENCE NEWS LETTER

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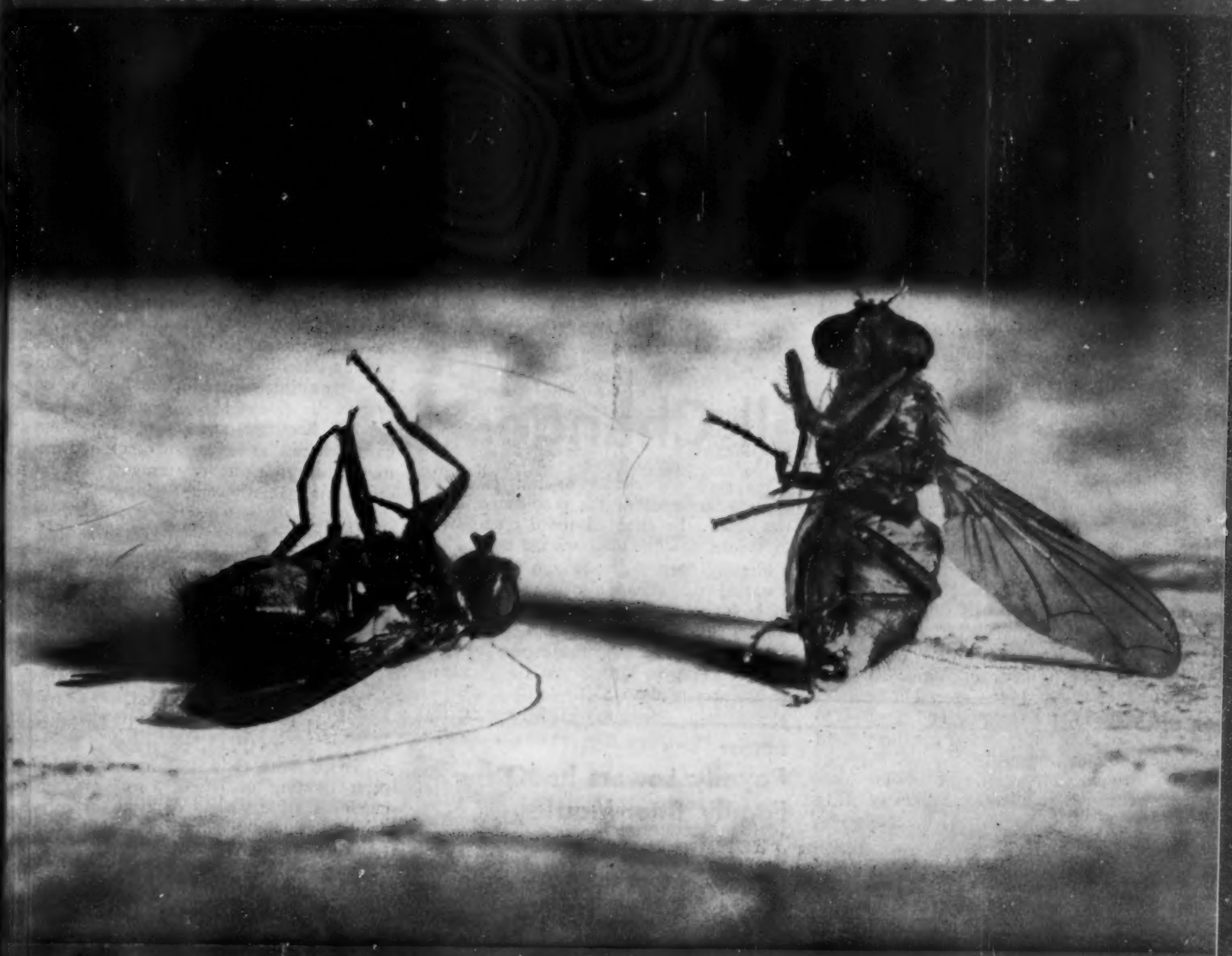

Death Dance

See page 330

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PSYCHIATRY

Health for Mentally Ill

A body chemical, histamine, promises to double the rate of recoveries in patients treated with shock alone, psychiatrists reveal.

➤ SPEEDIER and more lasting recoveries for the mentally ill are foreseen with the discovery that a body chemical can restore mental health and make shock treatments more effective.

Histamine, which comes from an amino acid present in all living cells, followed by electric shock treatments would double the number of patients leaving state hospitals at present following shock treatment alone, trials to date indicate.

This promise of restored health for the mentally ill was revealed in a preliminary report issued at Creedmoor State Hospital in New York by Dr. Johan H. W. van Ophuijsen, and three brothers, Dr. Arthur M., Mortimer D., and Raymond R. Sackler.

First tests were made on 38 female patients with the result that 10 improved and five of these were well on the way to recovery. In comparing this group with 25 patients treated by shock, the results were found comparable.

Further tests showed that patients who did not respond to shock treatment recovered after being treated with histamine followed by another course of shock. Also, the psychiatrists pointed out, they got a definite impression that fewer shock treatments are needed when injections of the chemical precede shock.

A three year follow-up of these patients further revealed that even if the histamine-treated patients have a relapse their chances for recovery are better. The doctors now believe that some patients need small doses of the chemical at intervals to keep them healthy, just as the diabetic needs insulin.

"As we see it now," they said, "histamine may well be joined by such biochemotherapeutic agents as the B vitamins (probably with significant reference to B-12 and nicotinic acid), insulin and others to offer medicine a third avenue of attack upon psychiatric disorders."

Science News Letter, May 21, 1949

CYTOGENETICS

Hereditary Cell Changes

➤ BENZENE hexachloride, one of the powerful new insecticides, is capable of producing drastic hereditary changes in plants by multiplying their chromosome counts, after the fashion of colchicine. This is disclosed in the journal SCIENCE (May 6) by Dr. Dontcho Kostoff of the Academy of Sciences in Sofia, Bulgaria.

Benzene hexachloride, known also by the longer chemical name of hexachlorocyclohexane, was used in several forms in Dr. Kostoff's experiments, and applied to a number of plants ranging from corn and wheat to sunflower and mustard. Many of the new, giant, multi-chromosome cells were abortive, but large numbers of them were capable of reproduction, continuing their novel kind.

Dr. Kostoff sees two possible significances in his discovery. The first may be beneficial: "The effect of hexachlorocyclohexane is so striking that it can be used as a polyploidizing agent, especially when one considers that it is much cheaper than other such agents."

The second possible significance is not so good, and leads to a warning: "Such insecticides or fungicides, when applied, may increase hereditary changes in cultivated varieties ("pure lines"), leading thus to more rapid degeneration of the highly bred, uniform varieties. This means that when such insecticides or fungicides are applied the seeds of the propagated varieties should be changed more often so as to secure new nondegenerated stocks."

Slightly over a decade ago Dr. Kostoff attracted the attention of geneticists, and of biologists generally, by his discovery of similar effects produced by a different chemical, acenaphthene. He was at that time working in Moscow, at the Academy of Sciences of the USSR.

Science News Letter, May 21, 1949

BIOLOGY

Royalty Lowers Its IQ by Family Inter-Marriages

➤ WHEN kings and princes marry within their own family, the intelligence of the children is generally lower than is that of the children of those who pick their brides outside the family.

This was found when Dr. S. A. Asdell, of Cornell University, studied the records of 690 members of royalty. In intelligence, they ranged from imbeciles and feebleminded, including Ivan and Feodor of Russia, sons of Alexis, and Charles of Spain, to such highly intelligent and successful rulers as Frederick the Great of Prussia and his sister Louise Ulrica, Queen of Sweden, Gustavus Vasa of Sweden, Louis II, the Great Conde, William the Silent of Orange and Catherine II, the Great, of Anhalt-Russia.

The rating on intelligence went steadily down as the record of inbreeding in the ancestry increased, Dr. Asdell reports in HUMAN BIOLOGY (Dec. 1948).

But this does not mean, he points out, that the inbreeding caused the low intelligence in the children. The men who chose their brides within the family were of lower intelligence than those who married girls not related to them.

The decline of intelligence with inbreeding is probably due, Dr. Asdell believes, to the poor stock which has selected wives within the immediate family.

Science News Letter, May 21, 1949

WILDLIFE

Spring Muskrat Trapping Called Menace to Ducks

➤ SPRING trapping for muskrat is a menace to the duck population, warns Jay S. Gashwiler of the Maine Cooperative Wildlife Research Unit, in the JOURNAL OF WILDLIFE MANAGEMENT (April).

Traps set for muskrat very often catch ducks instead—and this at the very beginning of the breeding season, when the females are due to bring off their broods in a short time. Total number of ducks thus killed is estimated at close to 2,000 in one year in the state of Maine alone. Since there are 21 other states and Canadian provinces in which similar losses can occur, the total muskrat-trap mortality among breeding ducks is apparently quite serious.

Science News Letter, May 21, 1949

INVENTION

New Device Says "When" In Making Mixed Drinks

➤ A NEW device for literally showing you just how much of what to put in mixed drinks has just been patented.

In the patent granted Guy P. Le Moyne of Fort Myers, Fla., he says that he has a device with which "anyone, without prior training or practice, may mix any one of a wide variety or types of mixed drinks with the accuracy of a skilled and trained bartender."

Mr. Le Moyne has put two glasses on a rack with graduated recipe strips for different drinks. His recipe strip, on a rod by the glasses, has instructions for mixing the drink, plus the lines that "say when" for each of the ingredients.

You change drinks by selecting different recipe strips. The two glasses permit up to three of the same drink to be made at one time.

Patent number 2,468,987 has been granted Mr. Le Moyne.

Science News Letter, May 21, 1949

MEDICINE

Test Blood Stickiness

A simple technique has been developed which will indicate to the doctor which patient is susceptible to having a blood plug form in the veins.

➤ YOUR doctor may drip your blood to see how quickly it gets sticky in a new, simple test devised to forestall complications that produce a blood plug in your veins. This possibility is the promise of a new technique revealed by Dr. John N. Shadid of Washington, D. C., to the Medical Society of the District of Columbia.

Doctors always fear that following a fractured hip, injury to a leg or an operation, a blood clot will form which may plug the lungs or brain and either incapacitate the patient or cause death. As a precaution against this, patients have been made to get out of bed shortly after surgery.

Dr. Shadid's test would be an invaluable adjunct to present procedures. It would tell doctors ahead of time by the stickiness of the patients' blood who would need treatment to check this dangerous development.

Here is how it's done: A small amount of blood is withdrawn into a syringe. The time it takes 15 drops of blood to drip from the needle is timed by a stop watch. A viscosity or stickiness index is worked out by dividing the time it takes distilled water to drip, into the time it takes blood to drip through. If the blood is in its normally fluid state it should take about 90 seconds.

The test was first given to 75 normal people ranging in age from 18 to 89 years. The viscosity index in these subjects varied between 4 and 5.5. These figures were arrived at after at least three tests were made on each person.

Sixteen other patients who were known to have diseases in which there was a blocking of a blood vessel by a clot, showed extremes in test results. The stickiness of their blood ranged from over 7.5 to a state where the blood clotted before there were 15 drops. The test was repeated for several days until the blood viscosity suddenly or gradually dropped to normal. These patients had been receiving treatment mainly with heparin, a drug which prevents blood-clotting.

Ten patients with conditions that might produce a blood clot also received the test. Two of these patients showed by the viscosity index that they might develop a blood clot, while the others were within normal range.

In conclusion, Dr. Shadid stated that the test is useful in picking out those patients who might need anticoagulant treatment and in determining the type of treatment, particularly when to give and when to stop anticoagulant treatment.

He proposes to make further tests on patients and present a report in the future on the results.

Science News Letter, May 21, 1949

NUCLEAR PHYSICS

Packaging Atomic Wastes

➤ A CEMENT mixer may be a part of the atomic-age laboratory equipment of the scientist who uses the radioactive by-products of the atomic bomb.

The cement mixer would do the job of a garbage grinder or the kitchen sink. One method of getting rid of radioactive waste materials, explains an Atomic Energy Commission circular, is to make concrete.

Radioactive waste materials are put in the liquid used in making the concrete. The hardened concrete is then stored away, dumped in the ocean or buried on land. The method of disposing of the radioactive concrete which should be used depends on the material.

Laboratories can dump the radioactive materials down the drain but they are advised to follow some pretty technical rules in doing it.

Recommended ways of getting rid of radioactive wastes are listed in a Commission report for scientists using these forms of chemical elements, which are now available to them on a relatively large scale.

If you want to put any of these radioactive isotopes down the sink, you must make sure that the main sewer is getting plenty of water to dilute the chemical. And the plumbing should be checked regularly for radioactivity, especially before any repairs are made.

The quantity of radioactive material which can be safely discharged into a sewer is stated in terms of radioactivity rather than quantities of the element. The unit used is the curie. A curie, named for the famous French scientists who discovered radium, is the activity of a substance in which 37,000,000,000 atoms disintegrate each second.

In letting radioactive iodine go down the sink, only one-half of a millionth of a curie should be discharged per liter (1.1 quarts) of water. And no scientific institution should let more than 200 thousandths of a curie of radioactive material get into a main sewer in a week.

This report on interim recommendations for disposal of the isotopes lists only iodine with an atomic weight of 131, phosphorus 32 and carbon 14. These three elements account for 90% of the activity of the radioactive isotopes which have been shipped to scientists thus far.

Science News Letter, May 21, 1949

CHEMISTRY

Chemical Methods Can Preserve Works of Art

➤ HOW modern chemistry can preserve art treasures, restore them or even show up fakes was described by Prof. Colin G. Fink of Columbia University.

Dr. Fink, who is associated with the Metropolitan Museum of Art in New York, explained that chemical methods are used at the Metropolitan Museum to keep harmful dust from settling on art pieces and remove or neutralize destructive acid particles.

A method of restoring corroded ancient bronzes has been developed by the Columbia chemist and is now being used in museums throughout the world. This technique reverses the corrosion process

BROTHER RAT LACKS VITAMIN B—The rat on the right has been fed a diet lacking in Vitamin B-12 while the one on the left has had adequate amounts of it. The effect of the vitamin on growth is clearly shown in these experiments being made at the University of Wisconsin biochemistry department.

and cleans the piece without removing any of the metal.

Tools of modern chemistry, such as the electrolytic cell, the ultraviolet lamp, the chemical microscope and the X-ray tube, can be used to decide whether an art work is genuine or a fraud or forgery, he pointed out.

Dr. Fink spoke to a meeting of the Minnesota section of the American Chemical Society at St. Olaf College, Northfield, Minn.

Science News Letter, May 21, 1949

PSYCHOLOGY

Roots of Crime in Home

➤ CRIME has its roots in bickering, nagging and other forms of tension in the home, Dr. David Abrahamsen, psychiatrist of Columbia University, told a New York forum on the Study and Prevention of Crime. He based his conclusion on a psychological study of 80 families of juvenile delinquents and criminals under a grant by the Josiah Macy Foundation. The first report of the project was summarized by Dr. Abrahamsen.

The family needs psychiatric treatment, as well as the offender, if the offender is to be cured of his criminal tendencies, the investigation revealed. Even in those cases where on the surface it appeared that the offender came from a reasonably happy home, the Rorschach ink-blot test of personality revealed that in almost all homes, the father or the mother and sometimes both needed psychiatric attention. In every one of the 80 homes studied there was hostility, nagging, bickering, all due to family tension. In one home the mother was found to be mentally ill, the father suffering from a compulsion, the brothers were neurotic and the only reasonably mentally well person was the offender himself.

In some cases the families did not want to continue treatment, but where cooperation was obtained the treatment resulted in remarkable reorientation of the offender to society.

The emotional atmosphere of the home is much more important from the point of view of crime prevention than is the economic condition, Dr. Abrahamsen found. Many of the offenders came from well-to-do homes but where the family was torn by antagonism. And many poor families are happy and do not produce criminals, he pointed out.

There should be a law, he recommended, that if the family cannot provide a home reasonably free from hostility, the child should be taken away and given to foster parents who would make the child welcome and give him the peaceful atmosphere he needs.

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PSYCHOLOGY

Without Knowing the Brand Smokers Have No Preference

➤ IF IT WERE not for the brand name on the package, psychological evidence is that you would not have a favorite kind of cigarette. In an experiment reported in Springfield, Mass., to the Eastern Psychological Association by Dr. Edwin A. Fleishman, of the University of Maryland, ten persons smoked cigarettes on which the name was masked by a distinctively colored scotch tape. No stable preferences were established. The only brand smoked more often than the others was the least expensive.

Each morning each of those taking part in the experiment received a box containing six different brands of cigarettes. All those of one brand were marked with the same color scotch tape, but the next day the colors were changed around. In the second week, the colors were not changed around from day to day.

Although all the clues for identifying the various cigarettes were available to the smokers, except for the brand name itself, they showed no stable preference for a favorite, nor a dislike either. They did form preferences and avoidances but these shifted from brand to brand.

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Question Box

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PSYCHOLOGY

Why Read Newspapers?

People want the news, they like to read, and some turn to it as an escape from boredom, interviews with people deprived of newspapers during a strike showed.

➤ IT IS the news that people miss when they fail to get their regular daily newspaper. And they miss it intensely.

In an effort to look behind this statement and get at the unconscious or basic psychological reasons why people read the newspaper, the Bureau of Applied Social Research, Columbia University, conducted lengthy interviews with 60 people, a cross section of the different economic strata in Manhattan. The interviews were conducted during the strike of newspaper deliverymen in New York City which deprived the average New Yorker of his paper.

Results are reported in a new book by Drs. Paul F. Lazarsfeld, professor of sociology at Columbia University, and Frank N. Stanton, president of the Columbia Broadcasting System, on COMMUNICATIONS RESEARCH 1948-1949 (Harper).

Although almost all those interviewed said that they missed the paper because they wanted to be informed about what was going on in the world, only about a third could name a serious news event which they wanted to follow up. Most of these mentioned the Far Eastern war. Half failed to name any news event on which they wanted the latest information. Others mentioned the then current murder case.

Many people, it was revealed, read the newspaper regularly because they like to read. When deprived of the newspaper, they would fall back on almost anything at hand—old magazines, even books. But the newspaper is preferred as a source of reading matter because it is most accessible, because it is cheap, and because the reading matter is divided into small units or capsules for easy consumption.

Some people read for escape from the boredom and worry of personal life. "When you read it takes your mind off other things," was a comment made during the interviews. The newspaper is particularly effective because of the variety and richness of its human interest content and because it is easily obtained. It is better for many than a mystery story because reading the newspaper does not cause any pricks of conscience. You tell yourself that you need to be informed.

For some people the newspaper is a tool for daily living. These are the people that turn immediately to the news of arrival of buyers or the shipping news. Several women follow the advertisements closely in order to plan their household buying. A couple of women said they follow the obituary notices and were afraid that acquaintances might die without their knowing it. Some missed the weather forecast.

Another group of readers use the newspaper to make them appear informed in social gatherings—for its conversational value.

One comment on missing the paper was: "Not that I am uneasy about what's happening but I like to know about the country so when people ask you questions you don't feel dumb and silly."

Some read the paper, it was found, in order to be brought into indirect personal contact with other people, especially distinguished persons. Such readers follow the gossip columns and the society pages. They read the personal advice columns in order to know the problems of other people and compare them with their own. They like the human interest stories.

For some, reading the newspaper is almost a compulsion or a ritual. They read their newspapers at a particular time of the day, during breakfast, while traveling to work, before bedtime, and when the paper was missing they felt lost, could not sleep, felt out of place on the subway.

One man said, "I don't know what I am missing—and when I don't know I worry." Others reported that they felt "cut off," but worried because "things go on whether you know or not."

Such people missed the paper more the longer they were deprived of it, instead of getting accustomed to its absence.

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WORLD'S BRIGHTEST LIGHT—This is one of the three billion peak candlepower krypton lights being prepared for service at the Cleveland Municipal Airport.

ENGINEERING

New Lighting System Will Speed Air Cargo Service

➤ AIR CARGO service on the heavily used freight route between Cleveland and Newark, N. J., will be able to operate in spite of bad weather with a 1,650-foot-long row of the world's brightest lights just installed at the Cleveland airport. The key of the system is a series of krypton lights, able to penetrate fog for at least 1,000 feet.

These krypton lamps, developed by Westinghouse Electric Corporation, have already been tested there and at America's foggiest airfield at Arcata, Calif. They have also been tested in Germany to help pilots on the Berlin airlift. Krypton is a rare gas obtained from the atmosphere which permits a greater brilliancy than the widely used atmospheric rare gases, neon and argon. Each of the krypton lights installed in Cleveland has a flash brilliance of some 3,000,000,000 candlepower.

In the installation, 11 krypton lamps al-

ternate in line with 11 neon lights. All 22 flash in rapid sequence 40 times a minute to appear as a stroke of lightning to the fog-bound pilot and guide him to the landing runway. These new approach lights work hand-in-glove with the airport's previously installed Instrument Landing System, the radio beam aid that directs the plane to the vicinity of the field and into position where the pilot can see the new "bottled lightning." The field is also to be equipped with Ground Controlled Approach (GCA) apparatus in which radar-scanning and radio-voice jockey planes into proper landing approach.

The Newark airport is already equipped with important bad weather landing aids. Since the Cleveland-Newark flight is the much used leg of many transcontinental freight runs, this new Cleveland lighting system means better cross-country cargo service. It will also be used in passenger traffic.

Science News Letter, May 21, 1949

GENERAL SCIENCE

Divorce Rates Climbing

➤ IT IS not just in Hollywood and Reno that divorce rates are climbing; the increase is world-wide. This is the finding of statisticians of the Metropolitan Life Insurance Company.

England and Wales, which 35 years ago had a divorce rate only one-fiftieth of ours, now has a rate half as large as that of the U. S. In 1913, England and Wales had only 2.2 divorces for every 1,000 in the annual marriage record.

At the outbreak of World War II, the ratio had increased 10 times or about 20 per 1,000. By 1946, the rate had climbed another four times to 81.0 and in 1947 divorces had climbed to 138.5 per 1,000 marriages.

In Scotland, the ratio of divorces to marriages was nine times as high in 1946 as in 1910. In Canada, the rise was even sharper—from 7.2 per 1,000 in 1920 to 60.0 per 1,000 in 1948.

On the continent of Europe, countries for which data are available all show a marked rise in divorce rate. In general, those with the lowest rates back in 1910, have the largest relative increase. In Belgium, the Netherlands, and Sweden, where divorces were formerly few, the rate has jumped to five or more times the rate in 1910. Switzerland, where the ratio was always high, now has a rate doubled.

Although, in England, the rising tide of divorces is attributable, at least in part, to the liberalization of divorce laws and the catching up with an accumulation of cases piled up during the war, the statisticians blame the disrupting effect of the war for the increase in broken families.

"Despite the fact," they comment, "that millions of men in the armed forces were out of reach of civilian judicial processes, and despite national crises which should have diverted thought from domestic affairs, the divorce rate continued to rise the world over during tthe greater part of World War II. This was the case even in the occupied countries.

"After the end of the war . . . the divorce rate showed a very sharp rise. In France, for example, the rate in 1946 was 207.2 per 1,000 average annual marriages . . . a figure more than twice that of the year before, and almost three times that in 1944. On the other hand, in the neutral countries, Sweden and Switzerland, the postwar rise was moderate."

There are indications, the statisticians report, that the postwar peak of divorces has already been passed in a number of countries. But it appears unlikely that the rate will return to prewar levels in the near future.

Science News Letter, May 21, 1949

PSYCHOLOGY

Mothers Flunk and Forget

➤ WHAT happened when mothers were given cut-up-design tests in the presence of their 11- to 13-year-old daughters and failed, was reported by Drs. Nevitt Sanford and Joseph Risser, of the University of California and Stockton Junior College, in the JOURNAL OF PERSONALITY (Dec. 1948).

Most of the daughters took their mothers' failures almost as hard as did the mothers themselves. Some were comforting: "That's all right, Mother; you'll get the next one." "You almost had it."

But two of the 26 daughters in the experiment said nothing but happily and excitedly bounced up and down in their seats, the experimenters report. Others made such unkind comments as: "Oh, Mama, can't you see that?" "Mama, you're stupid!" Either to help or to show their superiority, some daughters were unable to resist the temptation to help the mother make the design, although one got slapped for her pains.

The experiment was so arranged that each mother was first given three designs to make, which she could complete easily. Then she was given two in succession that it was known that she could not do.

After the second failure, the mothers, believing that the tests were graded in difficulty, anticipated more failures. Nearly all made excuses at this point: "My eyes are so tired, I just can't see how I can go on." "I just can't see these cards." "I have such a headache; perhaps we should do this another evening." "I don't see why the mothers have to take the test."

After the mothers had been allowed to succeed on nine of the design puzzles and had been failed on six, they were asked to recall the names of all the designs they had worked on.

They remembered those on which they had succeeded better than those that they had failed. The tendency to forget in the case of failure was greater than it had been found to be in previous experiments along the same line, a fact which the experimenters attribute to the greater blow to self-esteem suffered by these mothers in the very lifelike situation of failure in the presence of their adolescent daughters.

This self-defensive forgetting, the experimenters conclude, is most likely to occur when the need to regain self-respect is at its greatest.

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ENTOMOLOGY

Female Mosquito Song Recordings Trap Males

➤ ANOPHELINE Loreleis (female mosquitoes to you) lure males to their fates with tremulous voices. And, incidentally, those same alluring voices electrically transcribed and played back in a malarial swamp in Cuba brought males thronging to their death in traps.

These new facts about song and love in the mosquito world were related before the meeting of the Acoustical Society of America in New York by Drs. W. H. Offenhouser, Jr., and Morton C. Kahn of Cornell University Medical College. They made first recordings of malaria-mosquitoes' songs in Africa in the summer of 1947; made similar records and used them for trapping purposes in Cuba last year.

All mosquito sounds are "warble-modulated", they told their audience. The vibrato or tremolo effect comes at the rate of five cycles per second in some insects. Others have a double vibrato, with a higher 25 cycles per second rate superimposed on the five-per-second one. By human standards, the male mosquito would be judged a sissy; he sings, but his voice is higher-pitched than the female's.

The Cuban mosquito whose recorded song was used in trapping males is one of the worst of the malaria-carrying species, known scientifically as *Anopheles albimanus*. Translated literally, the name means the white-handed anopheles. Why that name, entomologists are unable to explain; only the rearmost of the insect's three pairs of feet are white.

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CHEMISTRY

Cold-Rubber Footwear

Tire-tread tests have shown this rubber to be longer wearing and more resistant to abrasion and it is believed it will show the same properties in footwear.

➤ LONG-LIFE footwear is expected with the use of the new synthetic "cold-rubber" that is predicted will double the life of automobile tire treads and is already in use on a limited number of passenger cars. The cold-rubber footwear is now being tested in Watertown, Mass., by the Hood Rubber Company, a division of the B. F. Goodrich Company, Akron, Ohio.

This rubber, polymerized or mixed at temperatures much lower than those used in the better-known synthetic rubbers, has been found to be longer wearing and to possess greater resistance to abrasion in tire-tread testing. Trials indicate that it may show the same properties in footwear.

A prediction that 75,000-mile tires will be available in the near future was made recently by Dr. Charles P. Fryling, of the Phillips Petroleum Company, Phillips, Texas. The reason for the exceptional strength of cold rubber, he said, seems to be the regular shape of its molecules. Rubber molecules he described as like barbed wire if they could be sufficiently magnified. In cold rubber the barbs would be more or less uniform.

Behind cold rubber is much wartime and later research on the part of several universities and the rubber industry. In the process, the rubber is made at freezing or sub-freezing temperatures. In the ordinary production of Buna S (GR-S) the rubber formation in the mixture used takes place at a temperature of 122 degrees Fahrenheit.

The cold rubber is made from the same mixture, chiefly butadiene and styrene, but a different catalyst is employed. In rubber making a catalyst is an oxidizing agent that promotes making big molecules out of small ones. One cold-rubber catalyst is cumene hydro-peroxide, which replaces the potassium persulfate in the ordinary synthetic rubber process.

Science News Letter, May 21, 1949

MEDICINE

Conquest of Smallpox

➤ SMALLPOX, once the most feared of all diseases in western civilization, today is known to most Americans only as the reason for being vaccinated, thanks to an English country doctor who was born two centuries ago this month.

Son of an English clergyman, Edward Jenner was born at Berkeley, England, May 17, 1749. After receiving his medical training in London, the young physician returned to his birthplace to practice. This decision may have been important to his great discovery.

While smallpox claimed a continuously high toll, striking the rich and poor alike, Dr. Jenner and others noted that one group of persons seemed to be immune. They were those, notably dairymaids, who had contracted the milder disease, cowpox, from cattle.

It was May 14, 1796, 153 years ago, that Jenner inoculated an eight-year-old James Phipps with cowpox. In July, he again inoculated the boy, this time with virulent smallpox virus. James Phipps did not contract smallpox, and vaccination was a proven weapon against the dread disease. Our word "vaccination" is derived from "vacca," a cow.

No unsung hero, Dr. Jenner received huge (for those days) awards of money from Parliament and world-wide recognition. His name is said to have swayed Napoleon and the King of Spain to release prisoners.

From the then-young United States, Jenner received enthusiastic tributes by President Jefferson and the president of the Boston Board of Health, Paul Revere.

Less well known than his dramatic experiment which made possible the conquest of smallpox is the fact that Jenner may have been the first to call attention to allergy as it occurs in an infectious disease.

Today, in an era of accelerated advances in medicine, the achievement of an English clergyman's son born two centuries ago is still a major weapon in man's war on disease.

Science News Letter, May 21, 1949

MEDICAL HERO'S ANNIVERSARY—Vaccination, discovered by Edward Jenner, is protecting us against once-dread smallpox 200 years after the famed English physician's birth.

VETERINARY MEDICINE

Cows Should Also See Dentist Twice a Year

➤ "SEE your dentist twice a year" is as good advice for Bossy as it is for Bossy's boss, declared Dr. L. M. Hurt, president of the American Veterinary Medical Association in Chicago. Cows are often benefited by dental attention, and return profit on the investment in better milk yield, he pointed out.

A typical and serious bovine dental ailment described by Dr. Hurt is known as "scissor-mouth". This is a condition wherein the lower jaw is considerably narrower than the upper, making it impossible for the poor animal to eat comfortably unless her teeth are dressed.

Science News Letter, May 21, 1949

ACOUSTICS

Machine to Carry Out Spoken Orders Predicted

➤ A MACHINE which can carry out spoken orders was predicted at the meeting of the Acoustical Society of America.

Dr. Homer Dudley of the Bell Telephone Laboratories, presenting a paper by a Hungarian scientist, explained that experimenters have been working for 200 years on making a machine which will speak.

"It may be that the future will see devices developed along this line so that the human voice can give commands which will be interpreted by a machine and the order carried out automatically without the intervention of a single human hand," the paper by Dr. T. H. Tarnoczy, Budapest, Hungary, suggested.

Credit for the first important device which could speak goes to an eighteenth century experimenter, Dr. Tarnoczy's paper explained. Wolfgang von Kempelen, a royal counselor of the Holy Roman Empire, simply tried to copy the human voice mechanism.

"He used a bellows for the lungs, a leather-covered ivory reed from a bag pipe for the vocal cords, a wooden box for the mouth cavity, an India rubber funnel for the mouth opening and a number of keys to displace moving parts for various consonant positions."

Modern speaking devices, developed by the Bell Telephone Laboratories more than a decade ago, are the Vocoder and Voder, which produce a variety of speech sounds with electrical instruments.

Today, the paper said, we are learning more about the simple meaning of information "hidden like skeletal patterns" in confusing and complex speech waves. Future machines may be able to obey vocal commands, as well as reproduce human speech sounds, the Hungarian scientist proposed.

Science News Letter, May 21, 1949

ENGINEERING

Better to Average Three Than Two Best of Three

➤ BEST two out of three isn't best.

This scientific finding was announced by Dr. W. J. Youden of the statistical engineering laboratory at the National Bureau of Standards.

Better than best two of three in many cases is the average of the three, Dr. Youden has discovered.

This finding has important applications for scientists and engineers. They make many measurements where the results vary. Three measurements are the smallest number which can reveal one of the answers to be wrong.

Given three different figures for the same measurement, many scientists now take the two which are closest and average them to get the "best two of three."

This "very often" leads to less precise results than an average of all three measurements, Dr. Youden declares.

A Bureau of Standards announcement explains that he made "an empirical study of triads drawn at random from a large group of measurements constructed to conform to the characteristics of a normally distributed set entirely free from gross errors."

What Dr. Youden did was to go over hundreds of sets of three measurements, charting the ratios of large to small differences in the figures. He concluded that the two-of-three system dropped third measurements which should be used.

Unsettled thus far is an old mathematical problem: A rule or standard for rejecting some observations. Statisticians, aided by new gains in theory, are again working on this, the Bureau reported.

Science News Letter, May 21, 1949

ENGINEERING

Contour Mapping Is Streamlined

➤ A CAR and a trailer with electronic equipment are used by scientists of the Sun Oil Company to replace the old-type land surveyor and his transit. The combination makes the job of determining elevations needed for contour mapping of large tracts of land both speedy and easy.

The heart of the new surveying equipment is an elevation meter, described by its inventor, Ford L. Johnson and Fred M. Mayes of Sun Company, as a complex electronic integrating mechanism. It is an automatic measuring instrument, mounted in the trailer, that keeps a running record of dips and rises in the land surface over which the trailer runs.

The trailer transporting the instruments which comprise the elevation meter is a three-wheeled affair. Two wheels on its left side follow exactly in the track of the towing car or truck. The third wheel, on the right side merely serves to balance the trailer.

Measuring instruments are attached to the left-hand wheels. An odometer measures the distance travelled. A pendulum records the inclination of the trailer. As the car and the trailer proceed along a route, both the distance-measuring counter and the angle-measuring unit send electrical signals from the trailer to an electronic calculator in the automobile.

In the search for new oil deposits, the elevation meter is used in conjunction with a gravity meter, an instrument long used in oil prospecting to obtain information relative to probable underground geological formations. In this application, the elevation meter provides correction for differences in elevation at which gravity meter readings were taken. Another use of the meter is in the production of topographic maps.

Science News Letter, May 21, 1949

IN SCIEN

ACOUSTICS

Suggest Kind of Noise, Not Amount, Annoys You

➤ IT MAY BE the kind of noise, not the amount, that annoys you. This was suggested to the Acoustical Society of America meeting in New York by Dr. G. L. Bonvallet of the Armour Research Foundation, Chicago.

He explained that studies show a loud, steady hum is less likely to bother you than quieter but abrupt noises.

Industrial sounds, it has been found, are more likely to be blamed than even louder traffic noises. Dr. Bonvallet said this is probably because the public feels that something can be done about the industrial noise. But auto horns and clanging street cars are rated major annoyances.

Can noise cause you serious physical or mental disturbance? That one needs more study, Dr. Ralph M. McGrath of the Western Electric Company told the sound scientists.

"Proof", explained Dr. McGrath, has been offered that noise can hurt you—and that it can't. Scientists will have to do more work before they can decide, he concluded.

Science News Letter, May 21, 1949

ACOUSTICS

Our "World of Noise" Can Be Hushed Some

➤ OUR "world of noise" can be made quieter by a few relatively simple changes, the Acoustical Society of America was told in New York.

Dr. Leo L. Beranek of the Massachusetts Institute of Technology charged that "buildings have become more and more flimsy."

Not only are our homes invaded by the sound of traffic and planes, but "what is worse, the noise of one's neighbors at play or in battle," he complained.

Here are some suggestions Dr. Beranek made for promoting peace and quiet:

Architects should plan homes so that noisy functions are separated from quieter ones.

Plumbing fixtures can be selected for quietness, as well as other virtues.

Rubber-tired buses can be substituted for street cars, subways for elevated trains.

Strictly enforced ordinances can reduce excessive horn-tooting by motorists.

Noisy commercial activities can be kept away from residential areas by zoning laws.

Science News Letter, May 21, 1949

E FIELDS

ACOUSTICS

Humidity Plays Upon Your Piano, Observations Show

➤ HOW your piano stays in tune depends upon the relative humidity in your living room, Dr. Robert W. Young, physicist of San Diego, Calif., told the Acoustical Society of America, meeting in New York.

Dr. Young described observations on a six-foot grand piano which he studied for a year in his own San Diego living room. The relative humidity there varied between 20% and 70%.

Within the three central octaves the tuning rose on the average 0.3% in frequency for each increase of 10% in relative humidity.

The effect of humidity is most noticeable when the piano is played with other instruments that are not similarly affected by moisture in the air.

Dr. Young's observations confirm the recommendation that pianos should be tuned with each change of season. Not only that, but the tuner should take into account the humidity at the time that he is doing the tuning. If the weather is dry, the tuning should be lower than usual.

Science News Letter, May 21, 1949

MEDICINE

TB Cases Are Increasing While Deaths Are Dropping

➤ TUBERCULOSIS is on the increase although deaths from the disease have been cut by 20% since 1940, according to Dr. Herbert R. Edwards, executive director of the New York Tuberculosis and Health Association and Godias J. Drolet, statistician and assistant director of the New York Association.

In the eight-year period, 1940 to 1947, TB deaths decreased by 12,364, from 60,428 to 48,064, they told the National Tuberculosis Association meeting in Detroit. During the same period new cases of the disease increased by 33,065, from 100,772 to 133,837.

"Who is it that needs our attention now—the dead or the living?" they queried.

Recognizing the role of mass X-ray surveys in the discovery of many new cases, Dr. Edwards nevertheless does not believe that they explain the increase. He points to New York City as an example. There new cases do not show much difference in the stage of the disease at the time of discovery and patients entering TB hospitals are still mostly advanced cases.

Dr. Edwards suggests that modern treatment may be responsible for the widening gap between new cases and fewer deaths.

"Onto the invaluable bed rest regime there have now been added the benefits of collapse therapy and daring surgical procedures, further assisted by the newer antibiotics," he declared.

"Just as chemotherapy has played a vital part in the treatment of pneumonia, lowering its mortality without necessarily the incidence or outbreak of the disease, so modern treatment of tuberculosis may be similarly affecting the mortality from the disease and yet not necessarily reducing the attack rate."

Science News Letter, May 21, 1949

ANTHROPOLOGY

Guatemalan Indian Tribe Shows Loss in Height

➤ MYSTERIOUS loss of height — nearly two inches in the course of some two centuries—by a group of Indians in Central America was reported by a Smithsonian Institution scientist.

The Indians are the descendants of the Maya, who were the most advanced New World tribe before Columbus. Dr. T. Dale Stewart, curator of physical anthropology at the Smithsonian, has measured some 200 Indians of Mayan stock in western Guatemala.

Comparing the modern Indians with skeletal remains of their ancestors, Dr. Stewart found that the modern Maya-speaking peoples are about five centimeters (nearly two inches) shorter.

This strange loss of height cannot be explained on economic factors, the scientist explained, because the modern Maya live as well as their ancestors. Some unfavorable factor, perhaps a loss in the soil of some element needed in traces in the human diet, has become pronounced during the past two centuries and caused the loss in stature, Dr. Stewart suspects.

Science News Letter, May 21, 1949

PHYSICS

Young Physicist Wins "Nature of Light" Award

➤ DR. JULIAN S. SCHWINGER, 31, professor of physics at Harvard University, was awarded the $2,000 Charles L. Mayer "Nature of Light" prize.

The award to Dr. Schwinger was announced by Dr. Harlow Shapley, director of the Harvard College Observatory and chairman of the National Science Fund of the National Academy of Sciences.

A special advisory committee of physicists cited three papers by the Harvard scientist as "the best contribution to a logical consistent theory of the interaction of charged particles with an electromagnetic field."

Science News Letter, May 21, 1949

GENERAL SCIENCE

Two Scientists Elected Science Service Trustees

➤ DR. L. A. MAYNARD, professor of nutrition and biochemistry at Cornell University, and Dr. Rene J. Dubos, bacteriologist and member of the Rockefeller Institute for Medical Research, have been elected new trustees of Science Service, the institution for the popularization of science.

Dr. Maynard was nominated by the National Academy of Sciences and Dr. Dubos was nominated by the National Research Council.

The following officers were renamed in annual meetings just concluded:

President: Dr. Harlow Shapley, director of Harvard College Observatory; vice-president and chairman of the executive committee: Dr. Alexander Wetmore, Secretary of Smithsonian Institution; treasurer: O. W. Riegel, director of Lee School of Journalism, Washington and Lee University; secretary: Watson Davis, director of Science Service.

Additional members elected to the executive committee were: Frank R. Ford, editor, Evansville (Ind.) Press, and Dr. Karl Lark-Horovitz, Purdue University.

The Board of Trustees of Science Service passed resolutions of appreciation of the long service of Dr. E. G. Conklin of Princeton University, Princeton, N. J., as a member of the executive committee, a responsibility that he insisted upon relinquishing. Dr. Conklin, who continues as a trustee, also served as president of Science Service from 1937 to 1945.

Science News Letter, May 21, 1949

WILDLIFE

"Friendly" Wild Animals May Have Rabies

➤ IF A SKUNK offers to get chummy, don't let it. But then, probably you don't need to be warned on that point.

Start over: If a little fox acts friendly and fearless, look out! That fox may be mad. Not mad at you, but just mad. Afflicted with rabies, hence very dangerous to play with.

The American Veterinary Medical Association warns that one possible symptom of rabies, in normally shy and elusive wild animals, is a boldness and easy approachability. Anyone taking advantage of this seeming friendliness runs a chance of being bitten, with exceedingly serious consequences.

An even greater danger from rabid wild animals is indirect: they may bite dogs, which then come home and develop the disease, right where they are likeliest to have chances to bite members of the family or domestic animals.

Science News Letter, May 21, 1949

ENTOMOLOGY

War Front Opened on Flies

The best anti-fly weapon is still clean-up. Despite many disturbing rumors about DDT, it still heads the list of chemical killers of the pests.

By DR. FRANK THONE

See Front Cover

➤ WAR on flies has opened again over a wide front. First encounters between man and the hordes of his winged enemies have already taken place in the warmer parts of the country, and as the weather warms up the conflict will become general throughout the land.

Weapons in man's hands as the battle opens are essentially the same now as they have been during the past two or three years: first and foremost, clean-up and elimination of fly breeding-places; second but still important, poisons, notably DDT. Other fly-killing compounds are coming to the fore, but DDT is still the number one weapon.

Rumors About DDT

Somewhat disturbing rumors have been going the rounds about DDT: that it has proven a failure through the development of resistant strains of flies; that it threatens national health by poisoning milk and other foods; that it is responsible for the advent of the mysterious "X" disease of cattle and "virus X" afflicting human beings. Two of these allegations contain some fact and some fallacy; the third one is fancy, pure and unalloyed. Both of these troublesome "X's"— which incidentally are unrelated —were known to science before DDT ever came on the market, so they could hardly have originated from it.

There is truth in the first statement: flies do continue to exist in communities where DDT has been used for a couple of years, and some of them are resistant to the action of the poison. That does not mean, however, that DDT has failed, or that wherever you see a fly in a DDT'd area it belongs to a resistant strain. Least of all does it mean that nothing can be done about such flies.

Presence of flies in places where DDT has been used may mean merely that people have been so naively confident of the kill-all powers of this relatively new weapon that they have neglected the use of older, less spectacular but still necessary methods of anti-fly fighting. It is still essential to cut the enemy off from his base of supplies by cleaning up all possible fly-breeding spots. This means seeing to it that your own garbage-can is tightly lidded and clean on the outside, that there are no piles of fermenting lawn clippings left about, that your city fathers either cover your city dumps over with cinders or clean earth or give them frequent mass DDT sprayings during the summer. It means also sticking your nose into your neighbor's business, to the extent of making sure there are no open manure piles within the cruising range of flies, and that alleys and areaways back of restaurants, markets and similar places are cleared of fermenting rubbish, and kept that way all summer long.

There are some communities, including some fairly good-sized and otherwise enlightened municipalities, where the idea of an anti-fly campaign is simply to hire one or more of the big DDT-fogging machines to go out and lay down a fly-killing mist once or twice during the whole summer. Fogs of that kind, if properly laid down, have deadly effectiveness against flies that happen to be on hand at the time, and will thus confer a fair degree of freedom from flies for a few days, but that is all. If the breeding-places are left undisturbed, in a week or ten days the air will be populated with pests again. It cannot be too strongly emphasized: there is no substitute for thorough and maintained clean-up.

DDT After Cleanup

After the clean-up you may go to work with DDT. Spray or paint all likely roosting-places, indoors and out, with the residual-type spray, first covering all exposed foods to prevent contamination. Window screens, screen doors and all points where flies are likely to attempt entry into the house should receive special attention.

Finally, have on hand one or more of the small hand-bombs containing both DDT for the kill and pyrethrum for a quick knock-down. New, low-pressure space-sprayers of this type are now available at relatively low prices, for use on flies that actually get into the house. Then you will have the happy result pictured on this week's cover of the SCIENCE NEWS LETTER—dead and dying flies.

If you find you have flies that defy your attack with either or both of these DDT weapons, then is time enough to give thought to the chances that they may be one of the new resistant strains. Since such insects have been reported from areas as widely separated as New England, the Southwest, the Midwest and the Pacific coast, there is always a chance that you may be confronted with such enemies.

Fortunately, you are still not weaponless if DDT fails you. Several new insecticides have been coming up during the past couple of years. Entomologists of the U. S. Department of Agriculture look with special favor on three of them just now: chlordane, methoxychlor and gamma benzene hexachloride. All three are effective against flies and a number of other household insect pests, and they have the further advantage of being less toxic to human beings and domestic animals than DDT. Methoxychlor is especially recommended in the latter connection.

Manufacturers will probably offer these, or combinations of them, under a variety of trade names. They must, however, print the actual formula somewhere on the label—never buy an insect spray until you have read the fine print and know what you are getting, and how much of it.

There are also some special, non-spray preparations now to be had. For example, one manufacturer has just announced the production of a white wall-coating that contains two good fly-killers, chlordane and toxaphene. Applied like calcimine or white-wash, it will plant death in the feet of flies that alight on it for weeks afterwards.

If you are buying any preparation labeled

FLY CASUALTIES—Norman Milin, of the Bureau of Entomology and Plant Quarantine, counts casualties after an insecticide test. The unique machine in the background gives measured doses of killing spray to known numbers of flies in screen-topped cells at the bases of the metal cylinders, as they move along on the turntable.

AEROSOL BOMB—It is cheap and useful for ridding rooms of flies and mosquitoes. It has good immediate effect, but is not intended for residual-type spraying.

as containing benzene hexachloride, insist on having a sniff at it first. There are several species of this compound, designated with letters of the Greek alphabet. Originally, the benzene hexachloride offered on the market was a mixture of all of them; it had a disagreeable smell and was rather more toxic than it should have been for general use by non-professionals.

One of the "ben-hex" brethren, however, has the triple advantage of being nearly odorless, highly poisonous to flies, and not very poisonous to man and his animals. This is gamma benzene hexachloride. If the label on the can or bottle specifies this one particular compound, using all three names, and if it doesn't smell bad when you sniff at it, then it is OK to purchase.

Another new synthetic fly-killer is a synthetic pyrethrum, which was developed by government entomologists only within the past few months. It is not yet on the market, but several chemical firms have expressed their interest in it, and it may be in production in another year or two. It has the same quick knock-down properties as natural pyrethrum, combined with much better fly-killing power, so it should be another good weapon in man's anti-fly armory when it does become commercially available.

As for the reports that DDT is menacing us as well as the flies with poisoned death, there seems to be little foundation for them. These rumors, however, have been widespread and persistent enough to cause scientists representing several government agencies—the Department of Agriculture, the Public Health Service, the Food and Drug Administration and the medical authorities of the Army and Navy, together with the Pan American Sanitary Bureau, to go into a serious huddle recently. They came up with a joint statement to the effect that while DDT is a poison and has been recognized as such from the beginning, "There is no evidence that the use of DDT in accordance with the recommendations of the various federal agencies has ever caused human sickness due to the DDT itself," and that while precautionary modifications have been made in the recommendations regarding its use for fly control in dairy barns, "There is no justification for public alarm as to the safety from the standpoint of DDT contamination."

Science News Letter, May 21, 1949

★ ★ ★ ★ ★ ★ ★ ★ ★ ★

WYOMING

Ride, fish, geologize or just relax. Now?

Paton Ranch will give you trout fishing in a mountain stream as it flows out of a canyon in the Big Horn Mountains, daily horseback rides along the picturesque trails and excellent food—most of which is grown on the ranch.

The region abounds in geological and historical interest—dinosaur bones, marine fossils and Indian implements are found nearby.

Write for folder—Paton Ranch, Shell, Wyoming.

NUCLEAR PHYSICS

New Atom Commissioner

➤ THE NEW scientist-member of the U. S. Atomic Energy Commission is a distinguished expert on the very complex theory of the atom who won undying fame as the author of a hard-to-read best seller.

Prof. Henry D. Smyth has been chairman of the department of physics at Princeton University since 1935. He took part in some of the early (1941) discussions which led to the successful development of the atomic bomb.

After playing an active role in the wartime Manhattan Project, he was assigned by the project's military boss, Maj. Gen. Leslie R. Groves, to write the first history of the atom bomb.

The book, issued shortly after the first brief announcements of Hiroshima and Nagasaki, had a big sale, despite the fact that it violated most of the rules for a best seller. Full title of the volume is A GENERAL ACCOUNT OF THE DEVELOPMENT OF METHODS OF USING ATOMIC ENERGY FOR MILITARY PURPOSES UNDER THE AUSPICES OF THE UNITED STATES GOVERNMENT, 1940-1945. It was quickly dubbed "The Smyth Report."

In his introduction, Dr. Smyth stated that the book was written for "scientists and engineers generally and . . . other college graduates with a good grounding in physics and chemistry."

Despite this, and the fact that the book begins with Einstein's theoretical contributions to atomic energy, it has rated as a best seller at the Government Printing Office. More than 26,000 copies have been sold by the GPO ((price is now 40 cents, up a nickel since 1945). Other thousands of copies have been sold in editions published by the Princeton University Press.

A science classic, the report has been criticized, chiefly by laymen, as telling too many "secrets" of the bomb.

Dr. Smyth's new superior, Chairman David E. Lilienthal of the Atomic Energy Commission, told a Senate committee two years ago that the report was a breach of security. Lately, however, Chairman Lilienthal has probably become more sympathetic. His own Commission's fifth semi-annual report has had similar criticism from congressmen.

The newly-named commissioner's own view was stated in the report which said that atomic energy raised political and social questions.

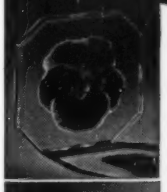
"The people of the country must be informed if they are to discharge their responsibilities wisely," the report concludes.

Before authoring the famed report, Dr. Smyth was a leader in developing the process for separation of the fissionable varieties of uranium from the more common, non-bomb kind. Fifteen years ago, he was one of a team of Princeton scientists who made the significant discovery of a rare isotope of the hydrogen atom.

Science News Letter, May 21, 1949

Plastic Coasters and Tiles

EMBED REAL FLOWERS in *NEW* Magic PLASTIC



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PSYCHIATRY

Psychiatry and Murder

➤ PSYCHIATRISTS are going out of the courtroom. They will appear less and less as contending witnesses and will be held more and more responsible for the treatment and care of the cases that "belong scientifically" to their province.

This is what should and probably will happen in the future, in the opinion of a psychiatrist, Dr. Fredric Wertham of New York, who has himself appeared as a witness in a number of murder trials.

In a new book, THE SHOW OF VIOLENCE (Doubleday), he says that instead of giving "individualistic and therefore evasive explanations for social ills," the psychiatrist "should not shirk his duty to determine the point where individual guilt resolves itself into social responsibility."

"Murder," he says, "grows from negative emotions, from fear and hatred, from anxiety and anger, from frustration and desperation, from jealousy and greed, from humiliation and spite, from repression and resentment."

The way to prevent murder, he says, is to change social conditions and circumstances so that the respect we say we have for human life is put into actual practice. But he does not think we should turn all or most offenders over to psychiatrists and abolish the concepts of responsibility, crime, punishment, and personal guilt. To do that would be not only impractical but harmful. It would "infringe on the safety of society and on the rights of the individual."

From Dr. Wertham's point of view, punishment has three aspects: (1) the protection of society; (2) the re-education of the delinquent; and (3) what his studies have "revealed as a neglected but important factor, the condemnation of the crime." (*See SNL*, May 14, p. 319.)

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Picture yourself with a new Phantomold on your Beltone Hearing Aid. You're poised and relaxed even in group conversation. And no one need know you're wearing a hearing aid! See this newest hearing improvement. Look up Beltone Distributor in your local phone book. Or, mail coupon to Chicago for valuable free booklet.

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AERONAUTICS

Fast Jets for Military

➤ AIRCRAFT flights already made at speeds faster than sound still leave aviation a long way from practical supersonic airplanes ready for military use, John F. Victory, executive secretary of the National Advisory Committee for Aeronautics, declared.

Keeping America first in the air was the theme of his discussion as a guest of Watson Davis, director of Science Service, on Adventures in Science, heard over the Columbia network. He reviewed the scientific research conducted by NACA and others, that has resulted in the present advanced stage in aviation and emphasized the need of further research for planes of tomorrow.

One of the great products of World War II was the simple lightweight, and powerful jet propulsion engine, he said. This was the first revolutionary principle in aviation. It gave the airplane a different form of thrust, whose efficiency was not limited or reduced by the speed of sound. Nevertheless, the maximum speed so far obtained by a practical service plane in level flight is less than 700 miles per hour.

Although jet propulsion has been known for thousands of years, its application to aircraft awaited new materials, developed by metallurgists, that could retain their strength at very high temperatures. Jet engines in various forms open up new vistas in the amount of power that can become available to shove airplanes through the transonic speed range and into the realm of supersonic flight. The rocket-powered X-1, which has already traveled faster than sound, is a good flight-research airplane and not a regular military plane. Its power lasts but for some two to four minutes.

The advent of supersonic flight opens up whole new realms of problems calling for new and expensive research equipment, he stated. At that, the cost of research is but a relatively small premium to pay to insure that the billions of dollars to be spent on aircraft will produce the best possible aircraft, at least superior to those of any other nation.

Among problems to be solved in supersonic flight is the so-called skin friction heating which raises the temperature in the pilot's cabin. The cockpit of a P-80 Shooting Star heats up 50 degrees Fahrenheit warmer than the outside air at 500 miles an hour. At the speed of sound, 760 miles per hour at sea level, it will heat up 100 degrees. At twice the speed of sound it would heat up 400 degrees. Efficient cabin-cooling system is an essential in supersonic planes.

Science News Letter, May 21, 1949

Words in Science—FAIR-CLEAR

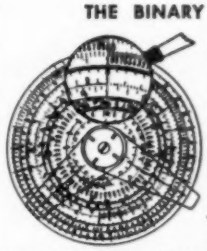
➤ FAIR, in weather predictions, does not mean the same as clear.

The word clear is used when the skies will be cloudless or so nearly cloudless that less than one tenth of their expanse will be covered with clouds and when visibility will be good.

Fair is used when the skies will be either clear or mostly clear—when there will be sunshine by day and the moon or stars will be visible at night. In other words, fair means fairly clear.

Science News Letter, May 21, 1949

THE BINARY SLIDE RULE



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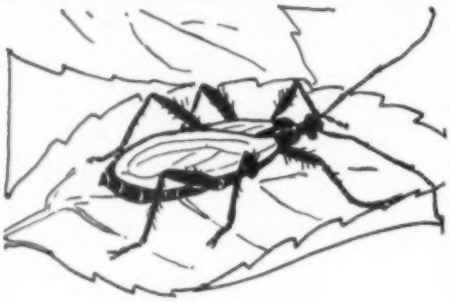
ENTOMOLOGY

NATURE RAMBLINGS

by Frank Thone



What are Bugs?

➤ SPRING gardeners, picnickers, outdoor folk generally must do battle with the bane of bugs— by which they mean not only all insects but such allied creeping things as spiders, centipedes, thousand-leggers, ticks and even scorpions. Some entomologists groan and protest over this loose use of a name they have long since given to be the official monopoly of one special group of insects, but most of the "bug-chasing" brethren have learned to save their breath.

The bugs of the stricter entomological definition are insects of the family Hemiptera. This Greek-derived word means "half-winged," and is descriptive of the typical true bug, which has shorter fore- than hind-wings. Even more typical, however, is the method of feeding common to this family. The mouthparts have evolved into a piercing sucking beak, which is sunk into the juicy parts of the plant—or into other insects, for some of the half-winged brotherhood are fiercely predatory. Familiar (too familiar!) examples are squash-bugs, stink-bugs, chinch-bugs, kissing-bugs (also called assassin-bugs—with better reason) and (whisper it!) bedbugs.

Professional entomologists however, should not be too high-nosed about insisting on reserving the name, bugs, for this one family. Originally, it didn't belong to insects and other creeping things at all. The first known form of the word was in Welsh, spelled (naturally!) "bwg," and it meant a ghost or hobgoblin.

As "bugge," this hobgoblin-name was familiar in early modern times, and even got into one of the first English Bibles, the Coverdale version of 1535. The fifth verse of Psalm 91 reads, "Thou shalt not nede to be afrayed for eny bugges by night." In the King James version, "bugges" has become merely "the terror."

This early use of the word "bug" to designate any vague and imaginary terror survives now only in such relics as bug-bear, bugaboo and bogey. Popular entomology has captured it—only to have possession slangily contested, of late years, by microbiologists, especially bacteriologists; also by mechanics who talk of "getting the bugs out" of a new machine that isn't working quite right.

Science News Letter, May 21, 1949

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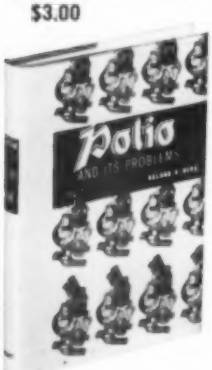

and its Problems

by Roland H. Berg

The dramatic cavalcade of tireless research, perilous experiment and stern persistence as science answers the challenge of infantile paralysis. Here is a tribute to those who fight against the disease —a record of the steps taken—a report of progress in treatment.

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ADOLESCENT FANTASY—Percival M. Symonds—*Columbia University Press,* 397 p., illus., $6.00. The daydreams of adolescent boys and girls studied as yielding understanding of their personality.

THE AMERICAN SOLDIER, Vol. 1: Adjustment during Army life; Vol. 2: Combat and its aftermath—Samuel A. Stouffer and others—*Princeton University Press,* Vol. 1: 599 p., illus., $7.50; Vol. 2: 675 p., illus., $7.50. Sponsored by the research branch of the army and editorially sponsored by the Social Science Research Council, this work is a monumental social psychology study. Volume 1 deals with adjustment in a social institution struggling to adapt its old traditions to the needs of modern man. An especially significant chapter, with new facts and new insight is "The Negro Soldier." Volume 2 studies American young men under stress, in ground and air warfare; what makes them fight. It analyzes anxiety and fear, group loyalty and formal and informal social controls.

ART AND SCIENTIFIC THOUGHT—Martin Johnson—*Columbia University Press,* 200 p., illus., $3.00. An investigation of the differences and likenesses between the scientific and the artistic attitudes to life.

BEGINNER'S GUIDE TO SEASHORE LIFE—Leon A. Hausman—*Putnam,* 128 p., illus., $2.00. This latest addition to the *Beginner's Guide Series* is written for those who want to know something of the many strange objects found on the beach and in the shallows of the seashore between the tides.

COLEOPTERA OR BEETLES EAST OF THE GREAT PLAINS—*J. Gordon Edwards,* 181 p., illus., $3.50. A text for beginning and casual Coleopterists.

INDENTATION HARDNESS TESTING—Vincent E. Lysaght— *Reinhold,* 288 p., illus., $5.50. Many problems involved in the hardness testing of metals and other materials are covered.

FAMILY HOUSING—Deane G. Carter and Keith H. Hinchcliff—*Wiley,* 265 p., illus., $4.00. Materials, equipment, and costs are discussed as well as building, buying, and financing. Written for the layman.

NEW INDUSTRY COMES TO THE SOUTH—*National Planning Association,* 32 p., paper, $1.00. The NPA Committee of the South's report on the major reasons why the South is rapidly becoming one of the nation's leading manufacturing regions.

ORGANOPHILIC BENTONITES: I. Swelling in Organic Liquids—John W. Jordan—*Mellon Institute,* 13 p., illus., paper, free upon request to the publisher, University of Pittsburgh, Pittsburgh 13, Pa. Presented at the Twenty-second National Colloid Symposium, June 23-25, 1948.

PLANNING BY AMERICANS IN AGRICULTURE, BUSINESS, LABOR AND THE PROFESSIONS: 1949 Report—*National Planning Association,* 36

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RADIO AND TELEVISION BIBLIOGRAPHY— Gertrude G. Broderick and Harry Moskowitz —*Gov't. Printing Office*, 33 p., paper, 15 cents. More than 400 references, each one accompanied by an annotated description.

THANK GOD FOR MY HEART ATTACK—Charles Yale Harrison—*Holt*, 144 p., $2.50. A distinguished novelist tells the story of his own experiences with an attack of coronary thrombosis.

TREATISE ON POWDER METALLURGY, Vol I—Claus G. Goetzel—*Interscience*, 778 p., illus., $15.00. The technology of metal powders and their products.

SLAVONIC ENCYCLOPAEDIA—Joseph S. Roucek, Ed.—*Philosophical Library*, 1,445 p., $18.50. The important developments of the history of the Slavic peoples.

YOU CAN'T WIN—Ernest E. Blanche—*Public Affairs Press*, 155 p., illus., $2.00. Facts and fallacies about gambling.

Science News Letter, May 21, 1949

Science Service Radio

➤ LISTEN in to a discussion on "New Research in Rheumatism" on "Adventures in Science" over the Columbia Broadcasting System at 3:15 p.m. EDST, May 28. Dr. Richard Freyberg, president of the American Rheumatism Association, Drs. Philip Hench and Edward Kendall of the Mayo Clinic, and Dr. W. S. C. Copeman of London, England, will be guests of Watson Davis, director of Science Service. These scientists will give a preview of the International Congress on Rheumatic Diseases to be held in New York City May 30-June 3, 1949. Drs. Hench and Kendall have discovered Compound E, a drug produced by the outer part of the adrenal gland, which has been used successfully in the treatment of arthritic patients, and they will discuss its use in the treatment of rheumatic patients.

Science News Letter, May 21, 1949

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Two New Mathematics Texts

ANALYTIC GEOMETRY

By **Alfred L. Nelson, Karl W. Folley,** and **William M. Borgman** of Wayne University

PREPARED for use in a freshman course in analytic geometry, this text is planned as preparation for the calculus rather than as a study of geometry. In order that it may be of maximum value to the future student of the calculus, the basic sciences, and engineering, considerable attention is given to two important problems of analytic geometry. They are (a) given the equation of a locus, to draw the curve, or describe it geometrically; (b) given the geometric description of a locus, to find its equation. There are brief tables of trigonometric, exponential and logarithmic functions that will enable the student to obtain decimal approximations to answers of problems that may be found throughout the book. *225 pages, $3.00*

INTRODUCTION TO ANALYTIC GEOMETRY AND THE CALCULUS

By **H. M. Dadourian,** Trinity College (Connecticut)

THIS TEXT was prepared for use in a combined course of Analytic Geometry and the Calculus such as is offered for liberal arts students not majoring in mathematics. While the amount of subject matter has been kept within the compass of such a course, there is no sacrifice of quality of material or presentation. This book presents the fundamental concepts of the Calculus in such manner as to give the student as good an idea as is possible in an elementary course of the methods and uses of this branch of mathematics. Little if any knowledge of trigonometry is required. *246 pages, $3.25*

COLLEGE PHYSICS

By **John G. Albright,** Rhode Island State College

OFFERS a more extensive treatment than that commonly presented in the usual general physics textbook. Subject matter is presented in the order of mechanics, heat, wave motion and sound, electricity and magnetism, and optics. Extensive problem material enables the student to get a good grasp of the text. *735 pages, $4.50*

PRINCIPLES OF PHYSICAL GEOLOGY

By **Arthur Holmes,** University of Edinburgh

A TEXT for beginning courses in general geology on the college level. The method of treatment adopted is one that twenty years' experience has shown to be successful in training students, in holding and developing their interest. Includes great discoveries of the past as well as many new ones. *532 pages, $4.50*

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PICNIC CARRYING CASE, which opens to form a low table, is large dress-suitcase size, and contains inside a removable waterproof food tray, leaving space for bathing suits. The two sides of the case form the table top, the opened case being held above the earth by hinged legs.

Science News Letter, May 21, 1949

FOLDING OVEN for campers is placed, not over, but near the fire and cooks by reflected heat. This aluminum affair has two compartments, both with triangular sides, and square sloping backs which are separated by a black-iron baking shelf. Heat from the fire is reflected against the iron plate by the sloping surfaces.

Science News Letter, May 21, 1949

HOSPITAL BED can be raised silently to treatment height in one minute by merely pressing a button on the outside of the footboard, out of reach of a patient. The lifting is done by a quarter-horsepower motor, installed below the spring, and a cleverly devised mechanism concealed in the end tubing.

Science News Letter, May 21, 1949

MECHANICAL HAND, shown in the picture, is an English development and is now on test at London's Emergency Limb Center. All its joints are like those of a normal hand, and its wearer can pick

up with it quarter-inch ball bearings and cigarettes.

Science News Letter, May 21, 1949

SEWING KIT, a neat, transparent, plastic, round box, holds six spools of thread in upright position, and has a porthole for each spool through which the loose end of the thread is extended. In the center is space for needle storage and a thimble.

Science News Letter, May 21, 1949

LOW-COST FIRE ALARM system for homes has five heat detectors for placement in strategic places. Each heat detector, wired in circuit to a four-inch alarm gong, consists of a highly sensitive thermostat mounted in a thin brass housing which functions at 140 degrees Fahrenheit.

Science News Letter, May 21, 1949

PLASTIC TINY FISH, for catching elusive game fish, has glittering eyes and a flexible fin and tail. It has two retractable fish hooks near the tail, concealed in the body. They are fastened to the fishline, and spring out to hold the gamester when he swallows the bait and pulls the line.

Science News Letter, May 21, 1949

LAUNDRY BAG, for use in transporting the family washing to and from self-service laundries, is made of a transparent rubber-like plastic through which moisture can get neither in nor out. It protects the seat of a car from dampness and keeps the laundry spotless.

Science News Letter, May 21, 1949

MIDGET RADIOACTIVITY detector has been made possible by the invention of a compact electronic scaling circuit which is used to automatically add up pulses from a sensitive Geiger counter tube. This portable, light-weight instrument is an aid to accurate radioactivity survey work and uranium prospecting.

Science News Letter, May 21, 1949

Do You Know?

Sixty pounds of extra *nitrogen* an acre applied to pea crops in two experimental plots last year in New York state resulted in increased yields ranging from 300 to 700 pounds of shelled peas.

Oslo, Norway, has a spring *clean-up week* in which government authorities and private citizens unite to clear winter debris from all streets and other public property and the property of individuals.

Blacksmith shops in motor trucks, which travel from farm to farm and to other places where there are horses to be shod, are becoming common in the United States, over 1,000 now being in use.

Treatment for *tonsils and adenoids* accounted for the bulk of Pennsylvania's expenditures in its new state program to aid school children whose parents can not afford the medical cost.

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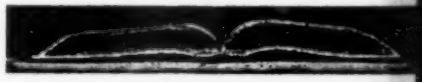

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